

Agenda

Presented by Ron Shapiro

Introduction to Grounding and Bonding Part 1

Definitions Ground fault paths - basic

Introduction to Grounding and Bonding Part 2

Review of ohms law Electric shock hazards
250.4 - General requirements for grounding and bonding
250.36 - High-impedance grounded neutral systems

Grounding Electrode System

250.50 - Grounding electrode system 250.52 - Grounding electrodes
250.53 - Grounding electrode system installation
250.54 - Auxiliary grounding electrodes

Grounding Electrode Conductors

250.62 - Grounding electrode conductor materials
250.64 - GEC installation 250.66 - GEC sizing
250.68 - GEC and bonding 250.70 - Methods of grounding and bonding

System Grounding Part 1

250.20 - AC systems to be grounded 250.21 - AC systems not required to be grounded
250.22 - Circuits not to be grounded 250.24(A) System grounding connections

System Grounding Part 2

250.24(B) - Main bonding jumpers
250.24(C) - Grounded conductors in service equipment
250.30 - Grounding separately derived AC systems
250.32 - Separate building feeders

Bonding Part 1

250.90 - General requirements 250.92 - Bonding of services
250.96 - Bonding other enclosures Ground fault paths - advanced

Bonding Part 2

250.102 - Bonding conductors and jumpers
250.104 - Bonding pipe systems and structural metal
250.106 - Lightning protection systems

Equipment Grounding & Conductors

250.110 - Equipment fastened in place 250.114 - Equipment connected by cord and plug
250.118 - Types of equipment grounding conductors
250.119 - ID of equipment grounding conductors
250.120 - EGC installation 250.122 - EGC sizing
250.126 - ID of wiring device terminals

Methods of Equipment Grounding

250.130 - EGC connections 250.136 - Equipment considered grounded
250.142 - Grounded conductor and grounding equipment
250.148 - EGC continuity and attachment

National Electrical Code 2017: Grounding and Bonding

Albany, NY - Tuesday, May 12, 2020

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Learning Objectives

You'll be able to:

Understand and use common terminology found in the National Electrical Code.

Review Ohms law, and discuss ground fault paths and electric shock hazards.

Review requirements for installing grounding electrode systems.

Identify AC systems to be grounded and AC systems not required to be grounded.

Differentiate grounding requirements for equipment fastened in place and equipment connected by cord and plug.

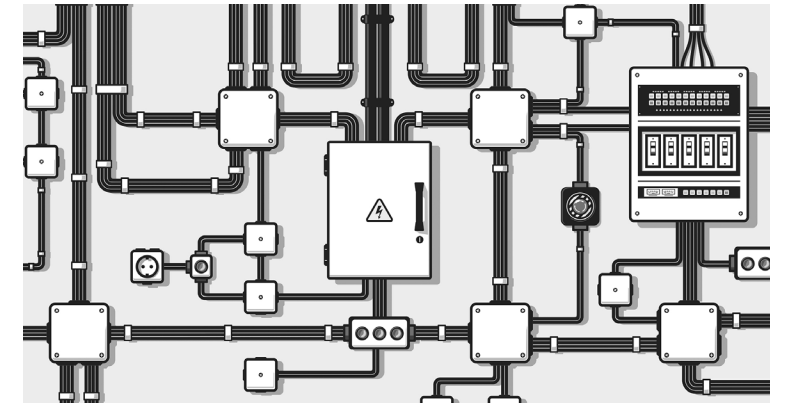
Comply with requirements for bonding of services, and for bonding conductors and jumpers.



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National Electrical Code 2017: Grounding and Bonding

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Review the basics of grounding and bonding

Get tips on system grounding

Learn about grounding electrode conductors

Comply with general requirements for bonding

Review requirements for equipment grounding and conductors

Discuss methods of equipment grounding

Continuing Education Credits

Architects

7.0 HSW Continuing Ed. Hours
7.0 AIA LU|HSW

International Code Council

.7 CEUs (Electrical)

Contractors

Non-Credit Continuing Ed.

Professional Engineers

7.0 Continuing Ed. Hours



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Ron Shapiro, P.E. *DLB Associates*

Mr. Shapiro is a professional engineer Licensed in New York State and has been practicing in the field of data center design and construction related electrical engineering for almost 30 years. Mr. Shapiro has a diverse background in the design and development of reliable electrical distribution, emergency power, lighting, and fire protection systems for commercial, educational, industrial and health care data center facilities. He is experienced in conceptual and actual critical electrical system design, coordination of internal and external trades, client communication and construction administration. Mr. Shapiro also has experience in power distribution design (switchgear, switchboards, transformer, standby power generation, UPS, and associated protection schemes); fire alarms (air aspiration and addressable types); system and raised floor grounding; security access control and CCTV; lighting design and associated manual or automatic controls; short circuit, coordination and arc flash studies; voltage drop; lightning protection and miscellaneous power. His experience also includes providing analysis/evaluation of existing and new electrical distribution systems and ancillary electrical infrastructure. Mr. Shapiro plays a critical role as technical code/theory adviser and internal educator for DLB Associates. He has coauthored “NEC 645 might not be for You” and “A Comparison Of Arc-Flash Incident Energy Reduction Techniques Using Low-Voltage Power Circuit Breakers”. Mr. Shapiro has lectured regarding varied data center-related electrical topics such as: “Fire Alarm Monitoring and Control Systems” for the *Society of Fire Protection Engineers*, and “Are We Ready for DC in the Data Center,” “Arc Flash in the Data Center Environment” and “Industry Trends in Electrical Systems” for the *Data Center Journal*. He has recently presented the 2017 NEC Update Seminar with HalfMoon Education.

Seminar Information

Marriott Albany 189 Wolf Road Albany, NY 12205 (518) 458-8444	Registration 8:00 - 8:30 am Morning Session 8:30 am - 12:30 pm	Lunch (On your own) 12:30 - 1:30 pm Afternoon Session 1:30 - 5:00 pm
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Tuition
\$299 for individual registration
\$279 for three or more simultaneous registrations.

Included with your registration:
Complimentary continental breakfast and printed seminar manual.
Registration does not include a copy of the Code itself.

How to Register

- Visit us online at www.halfmoonseminars.org
- Mail-in or fax the attached form to 715-835-6066
- Call customer service at 715-835-5900

Cancellations: Cancel at least 48 hours before the start of the seminar, and receive a full tuition refund, minus a \$39 service charge for each registrant. Cancellations within 48 hours will receive a credit toward another seminar. You may also send another person to take your place.

Additional Learning

Webinar Series

Compliance with the 2018 International Building Code

- **Compliance with the 2018 International Building Code, Part I**
Wed., April 8, 2020, 11:00 AM - 1:00 PM CDT
- **Compliance with the 2018 International Building Code, Part II**
Wed., April 8, 2020, 1:30 - 3:30 PM CDT
- **Compliance with the 2018 International Building Code, Part III**
Thurs., April 9, 2020, 11:00 AM - 12:30 PM CDT

Tree Science

- **Biology and Benefits of Trees**
Wed., April 15, 2020, 11:00 AM - 1:00 PM CDT
- **Tree Infrastructure: Design Elements That Appreciate**
Wed., April 15, 2020, 1:30 - 3:00 PM CDT
- **Trees and Site Requirements**
Thurs., April 16, 2020, 11:00 AM - 12:00 PM CDT
- **Project Completion and Tree Threat Prevention**
Thurs., April 16, 2020, 12:30 - 2:30 PM CDT

Continuing Education Credit Information

This seminar is open to the public and offers up to 7.0 HSW continuing education hours to architects and 7.0 continuing education hours to professional engineers in many states, including New York and New Jersey (HalfMoon Education is an approved continuing education sponsor for New Jersey engineers (Approval No. 24GP00000700).

HalfMoon Education is deemed a New York-approved continuing education provider for engineers and architects via its registration with the American Institute of Architects Continuing Education System (Regulations of the Commissioner §68.14(i)(2) and §69.6(i)(2)).

This event is approved by the American Institute of Architects Continuing Education System for 7.0 LU|HSW (Sponsor No. J885). Visit www.halfmoonseminars.org to view complete AIA information under this course listing. Only full attendance is reportable to the AIA/CES.

The International Code Council has approved this course for .7 CEUs in specialty area of Electrical (Preferred Provider No. 1232).

This event offers a non-credit continuing education opportunity to construction contractors. It has not been approved by any state with a continuing education requirement for contractors.

Attendance will be monitored, and attendance certificates will be available after the seminar for most individuals who complete the entire event. Attendance certificates not available at the seminar will be mailed to participants within fifteen business days.

Structural Forensic Engineering

- **Overview of the Role of Forensic Engineering**
Thurs., April 16, 2020, 11:00 - 12:30 PM CDT
- **Forensic Engineering Process and Forensic Engineering Report**
Thurs., April 16, 2020, 1:00 - 3:00 PM CDT
- **Causes of Structural Failures**
Fri., April 17, 2020, 11:00 - 12:30 PM CDT
- **Forensic Examination of Structures and Use in Litigation**
Fri., April 17, 2020, 1:00 - 3:00 PM CDT

Special Inspections under the IBC Chapter 17

- **Special Inspections under the IBC Chapter 17, Part I**
Wed., April 29, 2020, 11:00 AM - 2:15 PM CDT
- **Special Inspections under the IBC Chapter 17, Part II**
Thurs., April 30, 2020, 11:00 AM - 3:15 PM CDT

For more information and other online learning opportunities visit:
www.halfmoonseminars.org/webinars/

Registration

National Electrical Code 2017: Grounding and Bonding

Albany, NY - Tuesday, May 12, 2020

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Mail: HalfMoon Education Inc., PO Box 278, Altoona, WI 54720-0278		
Complete the entire form. Attach duplicates if necessary.		
() I need special accommodations. Please contact me.		

Tuition
() I will be attending the live seminar. Single Registrant - \$299.00 . Three or more registrants from the same company registering at the same time - \$279.00 each.
Checks: Make payable to HalfMoon Education Inc.
Credit Card: <i>Mastercard, Visa, American Express, or Discover</i>
Credit Card Number: _____
Expiration Date: _____ CVV2 Code: _____
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